INFN – Sezione di Roma 03-04-2008

Engineering Change of Order UG Crate Alessandro Bartoloni

ECO UGEMC 01-04-2008

"Filter Capacitor on 29 V power supply"

Problem Description

A problem was found during EMC test performed on QM2 UG crate using the SSP 30237 standard.

In particular the RF Conducted Energy Emission Test CE03 (15Khz-50Mhz) was not completed with success.

Solution

The problem can be solved with the addition of a 450 µF electrolytic capacitor placed in the UGBP (backplane card) between the +29V power supply line and ground.

After such modification the CE3 test was completed with success.

The required changes are:

UGBP : Add a 450 µF electrolytic capacitor between 29 Volt-A and ground and between 29 Volt-B and ground.

Capacitor used is VISHAY ST450-50L2MI.

Comments to: alessandro.bartoloni@roma1.infn.it

INFN – Sezione di Roma

Engineering Change of Order UGCrate/UGBC

03-09-2008

Alessandro Bartoloni

ECO UGRS232 01-09-2008

" UGSCM RS232 connections"

Problem Description

A problem was found on RS232 RX lines connecting UGBC-A (Hot) and UGBC-B (Cold) cards to UGSCM-A and to UGSCM-B cards.

When UGcrate A side is on, 5.6 Volt-A power supply propagates to 5.6 Volt-B power supply line through RS232 driver/receiver chips (MAX225) located on UGBC-B and vice versa.

The cause of this behavior is that UGBC-A and UGBC-B shares the RX lines to be able to communicate via RS232 with both UGSCMs.

Solution

The problem can be solved avoiding RX lines sharing and connecting, through RS232, UGBC-A with UGSCM-A and UGBC-B with UGSCM-B only.

Since both UGSCMs are powered by both 5.6 Volt-A and 5.6 Volt-B is also necessary to change the RX lines "pull-up" resistor with "pull-down".

Such changes implies that corresponding RS232 TX lines are no needed.

Logic diagrams of required changes are showed in figure 1 to 4 (see next pages).

The required changes are:

UGBC-A : Chip U21 disconnect from PCB pins 4 and 21, Chip U22 disconnect from PCB pins 3 and 22

UGBC-B : Chip U21 disconnect from PCB pins 3 and 22, Chip U22 disconnect from PCB pins 4 and 21

UGSCMs : Remove "pull-up" resistor R2

UGBP : Insert a 3000 Ohm ¼ Watt "pull-down" resistor on RX0_A signal and on RX0_B signal

Comments to: alessandro.bartoloni@roma1.infn.it

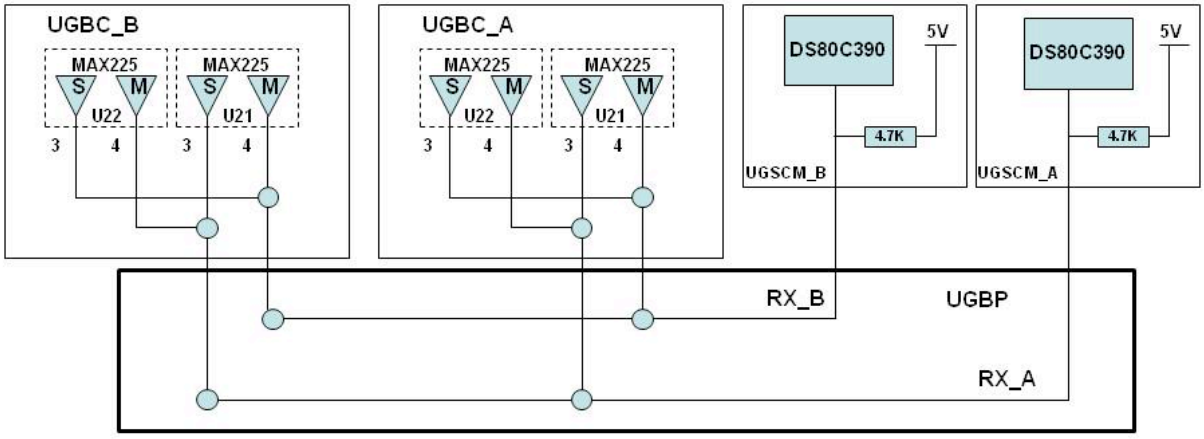

Fig 1. RS232 Rx lines scheme before changes

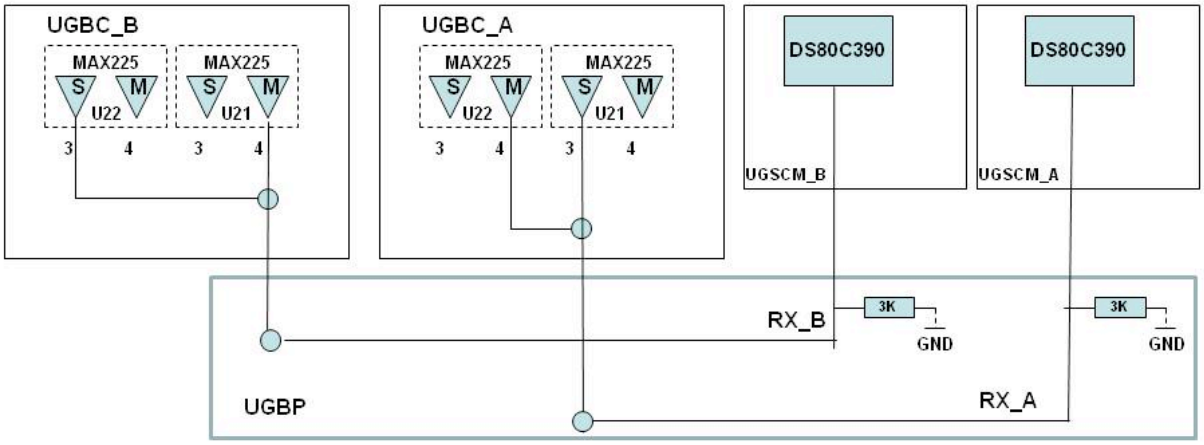

Fig 2. RS232 Rx lines scheme after changes

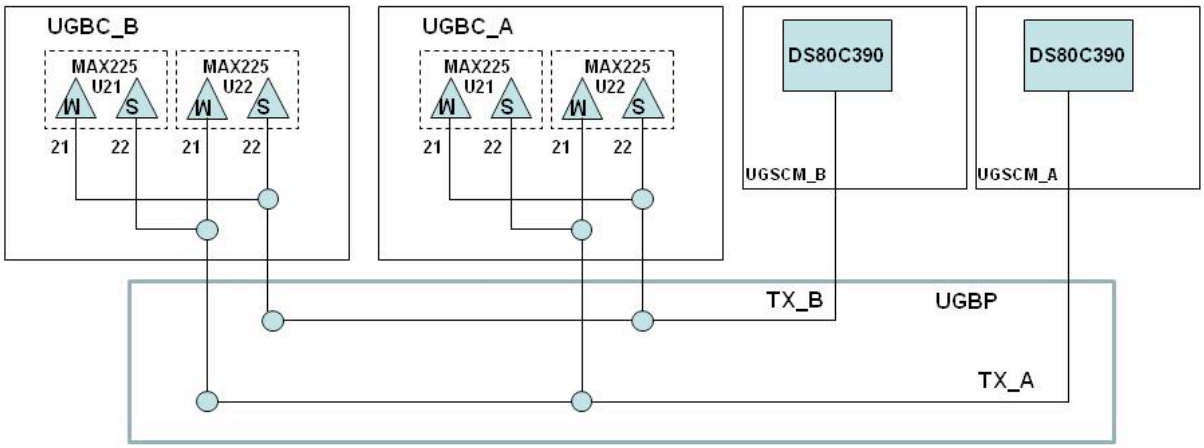

Fig. 3 RS232 TX lines before changes

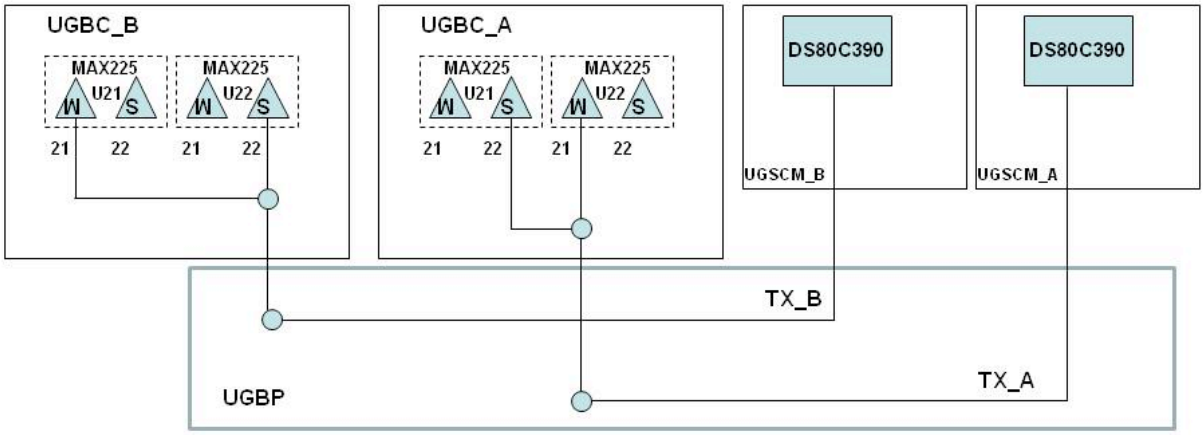

Fig. 4 RS232 TX lines after changes

INFN – Sezione di Roma 05-12-2008

Engineering Change of Order UGBP Alessandro Bartoloni

ECO UGBP_LB1 01-12-2008

"LVDS bias resistors replacement on UGBP line"

Problem Description

A problem was found on so-called Lecroy Buses (LB in the following) used for commands communication between UGSCM and UGBS, UGFV, UGBC cards.

Such buses are implemented using LVDS technology and bus signals are routed from one card to another by controlled impedance strip lines etched on the backplane card (UGBP).

LB data signals "pull down" resistors, soldered on the backplane, produce a bias voltage value at the input of LVDS receivers (SN65LVDS390PW) that exceed specifications.

The consequence is instability of the LVDS receiver's outputs when any card is not driving the bus.

The 8 "pull down" resistors are located on UGBP and are:

R41, R42, R43, R44, R31, R32, R33, R34

Current value for such resistors is 2500 Ohm ¼ W

Further the LB data signals (used for bidirectional communication) are terminated using 2 100 Ohm parallel resistors between the two differential signals (+ and -) located on the UGBP one at the start (UGSCM slot) and one at the end (UGxx slot) of the bus. This solution is not compatible with the LVDS technology selected if the described pull down is adopted.

Solution

The problem can be solved by changing the resistor values so that the bias voltage produced is compliant with the specifications.

The logic diagram of changes for one LB are showed in figure (see next page).

The new values are (BOM descriptors):

3300 Ohm for R41, R42, R43, R44

1800 Ohm for R31, R32, R33, R34

While termination resistors at the UGSCM slot side R01, R02, R03, R04 are removed.

Comments to: alessandro.bartoloni@roma1.infn.it

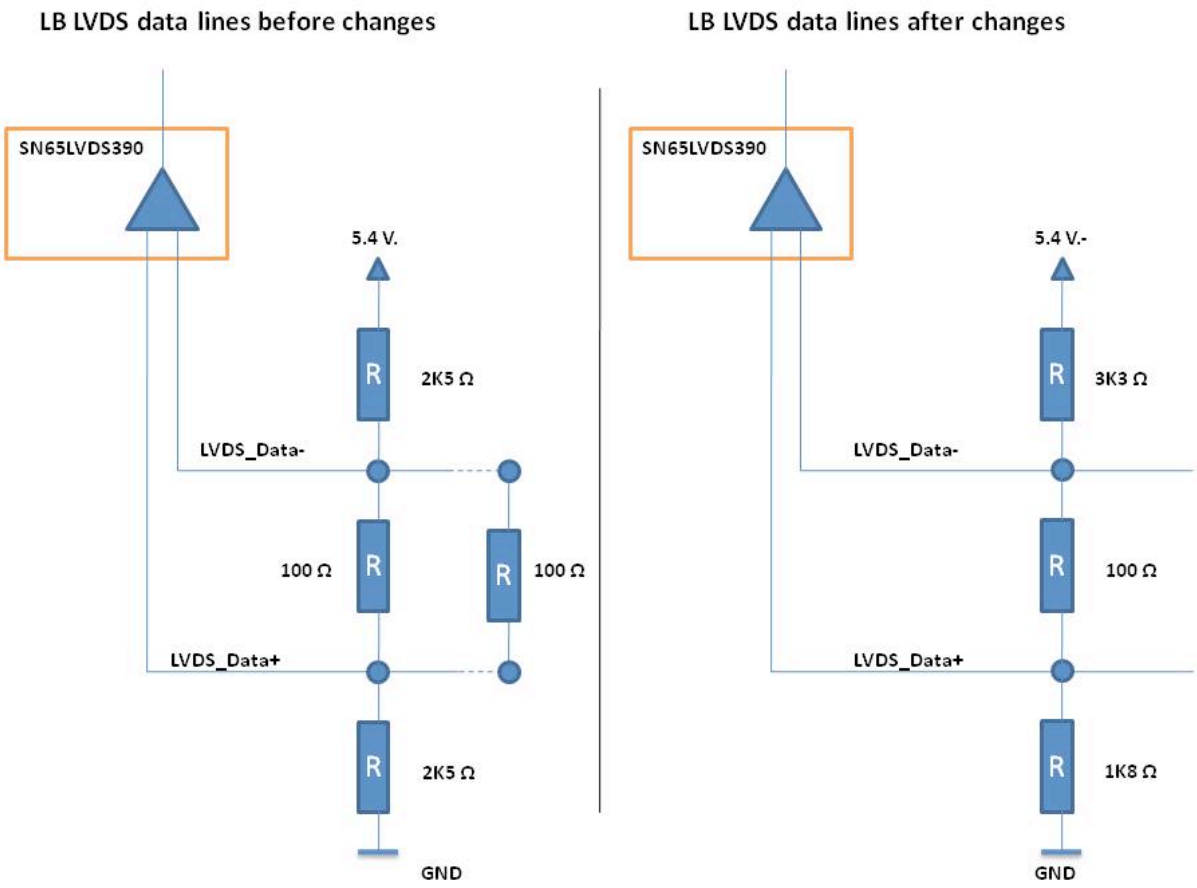

Fig. 1 Changes on Lecroy bus data lines on UGBP

INFN – Sezione di Roma 03-10-2008

Engineering Change of Order Lecroy Bus cable Alessandro Bartoloni

ECO LBC (01-10-2008)

"Lecroy Bus cable length correction"

Problem Description

A problem was found on the cable used to route lecroy buses connecting UGSCMs in UG crate and S9011AUG card in UGPD crate (LB_CABLE in the following).

The LB_CABLE is composed by 2 GLENAIR cables , with microD connector on one side, inserted in a protection sleeve and a braided shield.

The other side of the GLENAIR cables is soldered on the relative UGBP solder pads.

The actual length of LB_CABLE produced is of 80 cm while the requested one estimated through use of mechanical CAD is no less than 120 cm.

Solution

The actual cable is cut after few centimeter apart from the UGBP and new GLENAIR cables of the required length are soldered to make the LB_CABLE longer.

The following items are used:

M83513/04-B16 cables (Glenair)
Expando 686DM sleeve (Bentley-Harris)
Ray-99-06.0-3 Braided shield (Raychem)

Comments to: alessandro.bartoloni@roma1.infn.it

INFN – Sezione di Roma 03-09-2008

Engineering Change of Order UGBP Alessandro Bartoloni

ECO UGBP_LB2 01-09-2008

"LVDS bias resistors removal on UG-UGPD line"

Problem Description

A problem was found on so-called Lecroy Buses (LB in the following) used for commands communication between UGSCM cards in UG crate and S9011AUG card located in UGPD crate.

Such buses are implemented using LVDS technology and bus signals are routed from one card to another by controlled impedance strip lines etched on the backplane card (UGBP) plus cables connecting UG crate and UGPD crate.

LB data signals “pull down” resistors, soldered on the UGBP card (located in UG crate), produce a bias voltage value at the input of LVDS receivers located in S9011AUG card that are not necessary since such pull-down resistors are present in such board.

Further the LB data signals (used for bidirectional communication) are terminated using 2 100 Ohm parallel resistors between the two differential signals (+ and -) located one at the UG crate side and the other at the UGPD side (after cables). This solution is not compatible with the LVDS technology selected if the described pull down is adopted.

Solution

The problem can be solved by removing the resistors at UGBP side.

The resistors to remove are (BOM descriptors):

R102,R103,R104,R105,R106, R107, R108, R109, R110, R111, R112, R113

Comments to: alessandro.bartoloni@roma1.infn.it

INFN – Sezione di Roma 27-03-2009

Engineering Change of Order UGBS Alessandro Bartoloni

ECO UGSCM_DALLAS_SENSORS 27-03-2009

Problem Description

A different configuration of jumpers connecting UGSCM “dallas sensors” chain n.8 to UGBS JS2 connector is needed to comply with the actual TRDGAS cabling.

Such jumpers are implemented using six 0 Ohm resistors located on UGBS.

Solution

The new configuration is obtained changing the jumper configuration on some QM2, FM and FS UGBSs in the following way:

Remove three resistors on UGBS s/n 002 and 004 (BOM descriptors) :

R173, R175, R177 (see next page)

Mount three resistor (type RESTKSFM140R00) on UGBS s/n 002 , 004 and 005 (BOM descriptors):

R172, R174, R176 (see next page)

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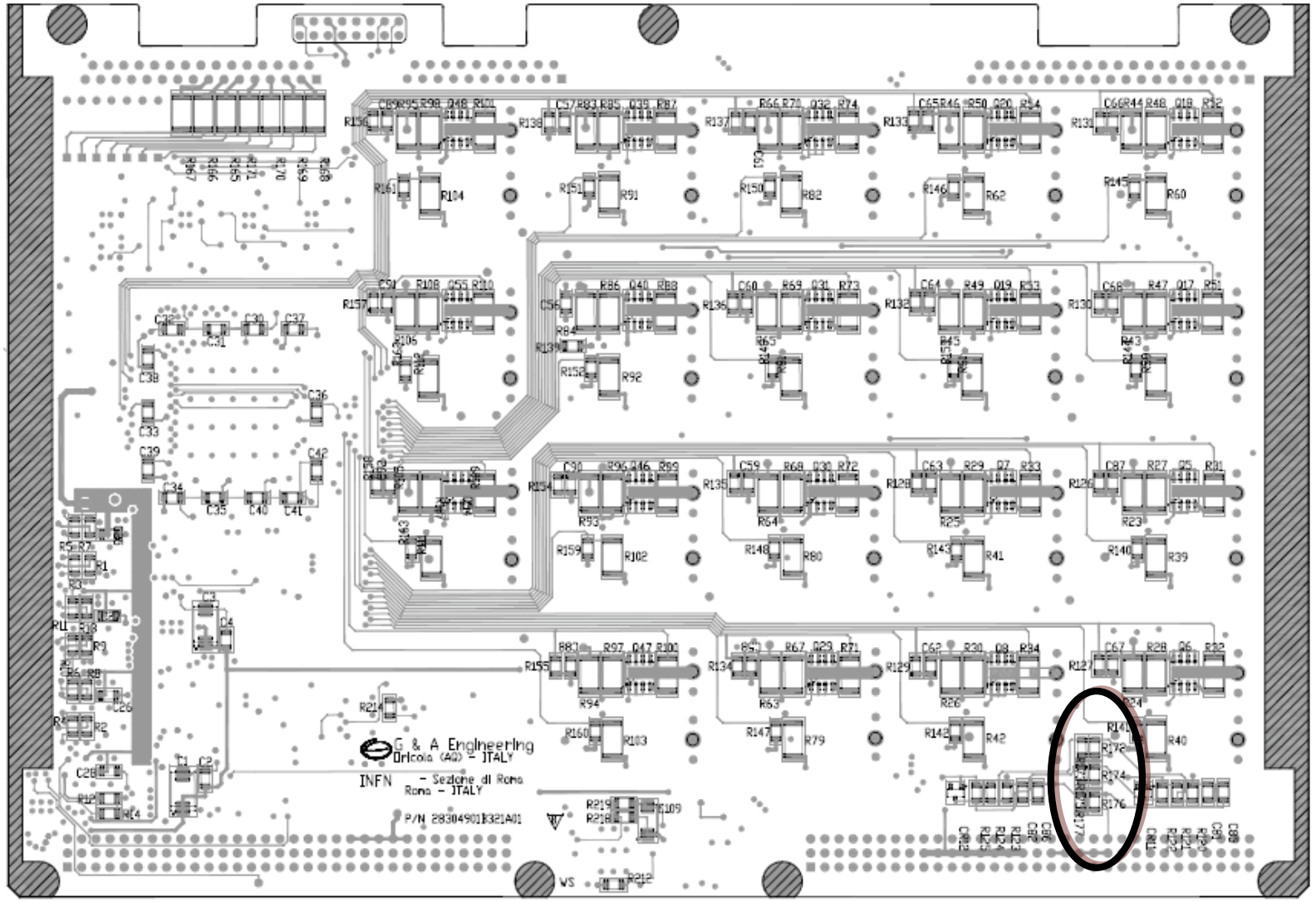
G & A Engineering
Oricola (AQ) - ITALY
INFN - Sezione di Roma
Roma - ITALY
P/N 2830490183210A01

INFN – Sezione di Roma 27-03-2009

Engineering Change of Order UGSCM Alessandro Bartoloni

ECO UGSCM_CANBUS 27-03-2009

Problem Description

A different configuration of jumpers connecting rear CANBUS connectors on UGSCM is needed to avoid a possible connection between CANBUS A with CANBUS B through the UGBP board.

Such jumpers are implemented with four 0 Ohm resistors actually present on each UGSCM.

Solution

The new configuration is obtained removing the jumper resistors on QM2, FM and FS UGSCMs (s/n A1, A2, A3, A4, A5, A6).

Such way no more connection between CANBUS rear connector and front connector is present.

The four resistors to remove are (BOM descriptors):

R94, R95, R111, R112 (see next page)

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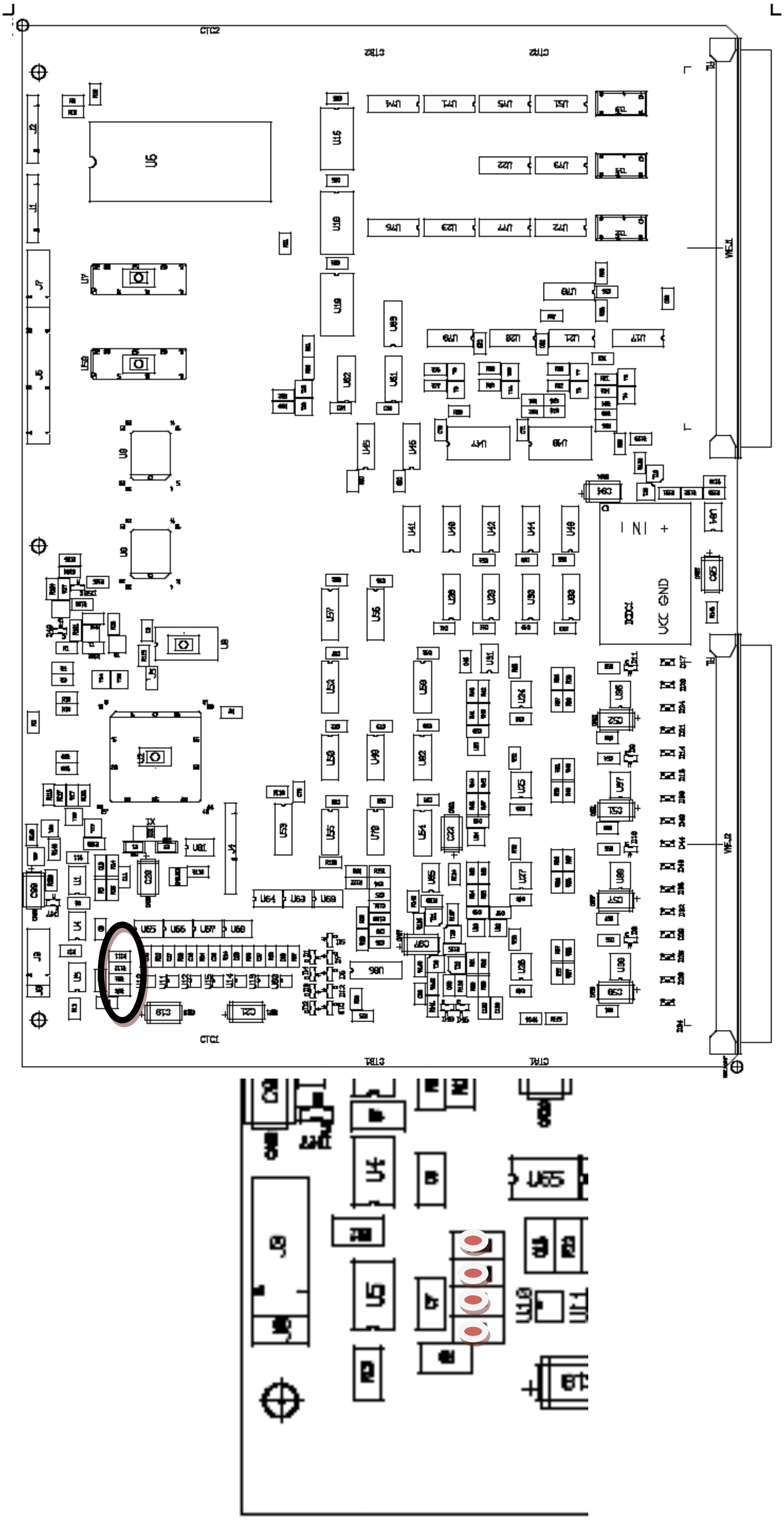

CTC2
CTC1
U6
U65
U66
U67
U68
U64
U63
J9
U5
U4